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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/438,786 11/12/99 HARA

K 00144/122111

EXAMINER

FERGINS, K

ART UNIT	PAPER NUMBER
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2861

DATE MAILED:

04/25/01

MM91/0425
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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/438,786

Applicant(s)

Hara et al.

Examiner

K. Feggins

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9, 11-14, 16-18 and 21-23 is/are rejected.
- 7) ☒ Claim(s) 5, 10, 15, 19 and 20 is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 1999 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 & 6.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Drawings

1. Figure 6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Claim Rejections - 35 USC § 112

2. Claim 4 is are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear as to what the Applicant considers to be an inclined section that's inclined "gently" and one that's inclined "sharply".

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-4, 6-8, 17-18 & 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Kobayashi et al. (6,036,299).

Kobayashi et al. discloses the following claimed limitations:

- * an ink jet recording apparatus_{1, 6} (see title)
- * a flashing/flushing signal generating unit/flushing controlling means, that generates a flashing/flushing signal (figs 2-5 & 8), the flashing/flushing signal is the function of a signal being on during a time period and off during a time period.

* a recording head provided with a nozzle and capable of jetting ink particles through the nozzle on the basis of the flashing/flushing signal (col 4, lines 25-38)

* wherein the flashing/flushing signal causes the recording head to jet ink particles through the nozzle so that each of the ink particles is a main ink particle (col 4, lines 25-38, col 5, lines 42-67, col 6, lines 1-20).

* wherein the flashing/flushing signal is periodic signal_{2,7} (figs 8a-8g & 9)

* wherein the periodic signal has periodic pulses, and each of the pulses has a trapezoidal waveform having a first inclined section, a potential maintaining section continuous with the first inclined section and a second inclined section continuous with the potential maintaining section_{3,8} (figs 8a-8g)

* wherein the first inclined section is inclined gently and the second inclined section is inclined sharply₄ (figs 8a-8f)

* wherein the flashing/flushing signal causes the recording head to jet ink particles through the nozzle so that each of the ink particles has a momentum greater than a predetermined value/time_{6c} (col 7, lines 1-44, col 11, lines 41-55, figs 5 & 14).

* further comprising a capping means capable of sealing the nozzle of the recording head, and wherein the ink particles jetted by the recording head through the

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nozzle on the basis of the flashing signal are caught by the capping means₁₇ (col 4, lines 25-38, figs 3 & 10-14)

* a member provided with an opening opposite to which the nozzles of the recording head can be disposed₁₈ (fig 14)

* an ink absorbing member/waste ink tank disposed on the side of a bottom part of the opening (see fig 14)

* wherein the ink particles jetted by the recording head through the nozzle on the basis of the flashing signal fly through the opening and are caught/contained by the ink absorbing member/waste tank (fig 14).

* wherein the flashing signal is generated separately from a printing signal on the basis of printing data₂₃ (figs 2-4).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9, 11-14 & 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,036,299) in view of Applicant's Admitted Prior Art (AAPA, the specification p 18 , line 33 & fig 6).

Kobayashi et al. discloses the following claimed limitation:

* wherein there is a duration of each of the pulses, a gradient of the first inclined section, a level of the potential maintaining section, and a gradient of the second inclined section₉ (col 11, lines 66-67, col 12, lines 1-26, figs 8a-8f).

* wherein the flashing/flushing signal is periodic signal₁₂ (figs 8a-8g & 9)

* wherein the periodic signal has periodic pulses, and each of the pulses has a trapezoidal waveform having a first inclined section, a potential maintaining section continuous with the first inclined section and a second inclined section continuous with the potential maintaining section₁₃ (figs 8a-8g)

* wherein the flashing signal has a frequency₁₄ (figs 8a-8f, see MPEP 2144.03)

* wherein the predetermined distance/fixed interval from the nozzle₁₆ (col 4, lines 25-38)

Kobayashi et al. does not disclose the following claimed limitation:

* wherein a duration of each of the pulses is 25 μ s, a gradient of the first inclined section is 10v/ μ s, a level of the potential maintaining section is 20V, and a gradient of the second inclined section is 9.6V/ μ s₉

* wherein the flashing signal has a frequency of 10kHz or above₁₄

* wherein the predetermined distance/fixed interval from the nozzle is 2mm₁₆

However, since it has been held that discovering an optimum value of a result effective variable and that discovering the optimum or workable ranges involves only routine skill in the art, *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) and *In re Aller*, 105 USPQ 233, respectively. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a duration of each of the pulses is 25μs, a gradient of the first inclined section is 10v/μs, a level of the potential maintaining section is 20V, and a gradient of the second inclined section is 9.6V/μs for the purpose of being capable of reliably overcoming faulty printing immediately after the cleaning operation; a the flashing signal that has a frequency of 10kHz or above and having a predetermined distance from the nozzle is 2mm for the purpose of providing an ink jet recording apparatus which is capable of recovering ink-droplet discharging capabilities by allowing the ink with increased viscosity in the recording head to be discharged speedily.

Furthermore, AAPA discloses the following claimed limitation:

* wherein the flashing signal causes the recording head to intermittently jet the ink particles through the nozzle so that the ink particles included sets of a main/large ink particles and minute/small ink particles after the main/large ink particle, and the minute/small particles of the set combine with a main/large ink particle of a following set in a range of a predetermined distance from the nozzle₁₁ (specification p 18, line 33 & fig 6).

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It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a flashing signal which causes the recording head to intermittently jet the ink particles through the nozzle so that the ink particles included sets of a main/large ink particles and minute/small ink particles after the main/large ink particle, and the minute/small particles of the set combine with a main/large ink particle of a following set in a range of a predetermined distance from the nozzle, taught by AAPA into Kobayashi et al. for the purpose of removing large and small particles from the nozzles of the printhead during the cleaning operation.

7. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,036,299) in view of Barrett et al. (5,682,191).

Kobayashi et al. discloses the following claimed limitations:

* cleaning control means that inhibits operation not relating to the cleaning operation; therefore means for stopping the fan (which is utilized for cooling during printing) during a flashing/flushing, therein part the cleaning operation, in which the recording head jets ink particles through the nozzle₂₁, (col 6, lines 18-20, figs 4-5).

* wherein the fan control means/cleaning control means keeps the fan stopped at least until the ink particles jetted by the recording head through the nozzles on the basis of the flashing signal arrive at and are caught by the ink absorbing member₂₂ (col 6, lines 18-20, figs 4-5),

Kobayashi et al. does not discloses the following claimed limitations:

- * a fan for preventing a temperature rise of the recording apparatus

Barrett et al. discloses the following claimed limitations:

- * a fan for preventing a temperature rise/cool fan module of the recording apparatus₂₁ (col 3, lines 40-47, fig 1)

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a fan for preventing a temperature rise of the recording apparatus, taught by Barrett et al. into Kobayashi et al. for the purpose of providing a cooling module within the recording apparatus.

Allowable Subject Matter

8. Claims 5, 10, 15 & 19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art fail to over come the entire combination of the applicants' teaching of an ink jet recording apparatus in the combination as claimed that comprises of flashing signal causes the recording head to jet ink particles through the nozzle so that each of ht ink particles is a main particle and the ink particles jetted through the nozzle flies at a speed of 5m/s or above; wherein the momentum of the ink particles are jetted through the nozzle has a weight of 10ng or above and flies at a speed of 4m/s or above; and further comprising a recording head that provides a plurality of nozzles for different inks,


and different flashing signals are used for the nozzles for jetting the different inks, respectively; and/or in addition to, the recording head is may also includes a plurality of flashing regions formed, and the ink particles of the different inks are jetted by the head through the plurality of nozzles are caught in the different flashing regions, respectively.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 703-306-4548. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 703-308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


RF
April 23, 2001


N. Le
Supervisory Patent Examiner
Technology Center 2800